

## PROGRESS ON PATHS TO TYPE IA SUPERNOVAE

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Type Ia supernovae are likely the result of sudden unstable carbon burning and the resulting disruption and explosion of a  $\approx 1.3M_{\odot}$  white dwarf. The  $0.1 - 1.0M_{\odot}$  of  $^{56}\text{Ni}$  made in the event leads to a few month display at luminosities often exceeding that of the host galaxy. After summarizing some of the physics puzzles presented by these core ignitions, I will present the evidence for two distinct populations of Type Ia supernovae that depend on the age of the galaxy in which these 'standardizable' candles explode. The CFHT Supernova Legacy Survey has dramatically confirmed the presence of Type Ia supernovae in both young ( $< \text{Gyr}$ ) and old ( $> 10 \text{ Gyr}$ ) stellar populations, and shown that these two channels do not yield the same distributions in the produced  $^{56}\text{Ni}$  mass. Unfortunately, there is yet to be an understanding of these contrasts, but the data certainly constrain the possible binary channels.